which is not appreciably slower than the latent period of the current of action. Other papers published with Ferrier in 1881, on the functional association of motor fibres in the anterior roots of the brachial and sacral plexuses of the monkey, and in 1884, on cerebral localisation in the Philosophical Transactions, formed early and important contributions to those investigations on the functions of the central nervous system which have since been so extensively carried out by English physiologists. One of Yeo's researches, that on the gaseous metabolism of cardiac muscle, was of particular interest. He determined, by spectroscopic examination of the living heart and its fluid contents, the rate at which resting and active muscle utilised the oxygen of oxy-hæmoglobin.

At the time of the resignation of his professorship Yeo practically severed his connection with physiology, and his interest in this was largely replaced by the occupations of a country life. He was therefore but little known to younger men, who may not remember that much of the organised attack on the experimental methods of physiologists and pathologists was directed against work carried out by Yeo and others in his laboratory. Apart from his actual scientific work, he will be remembered by all who have the best interests of medicine at heart for his uncompromising attitude towards those who, either from ignorance or mistaken views of the ethics of the subject, strove to hinder, if not actually to prevent, physiological research in this country. G. A. B.

DR. BINDON BLOOD STONEY, F.R.S.

WITHIN a few weeks of his eighty-first year, Dr. Bindon Blood Stoney, F.R.S., died at Dublin on May 5. Dr. Stoney was born at Oakley Park, Birr, in 1828, and educated at Trinity College, Dublin, where he had a distinguished engineering course, graduating in 1850. His abilities were early perceived by the then Earl of Rosse, whom he assisted in the astronomical researches of the early 'fifties of last century. In 1852 he went to Spain, and was engaged on railway work in that country. On his return home he was engaged in the important work of the Boyne Viaduct, which was regarded as a remarkable engineering achievement at that time. It is, however, by reason of his work as engineer to the Dublin Port and Docks Board that Dr. Stoney will be most remembered. He was appointed assistant engineer to the board in 1856, and three years later chief engineer to the port, a position which he held until 1898. During his tenure of office, Dublin was converted from a purely tidal port into one in which some of the largest vessels may be moored alongside the quays and lie constantly afloat, and the river so deepened that the cross-channel steamers may enter and leave at all states of the tide. In this work Dr. Stoney used the method of laying down the harbour walls by means of large blocks of masonry, weighing as much as 350 tons, and sunk by means of shears on a prepared foundation, the quay walls of the Alexandra Basin, the North Quay extension, and other work being laid in this manner.

During the period of his association with the Port and Docks Board, Dr. Stoney was also engineer for the construction of the O'Connell Bridge and the building of the Butt Bridge, and the reconstruction of the Grattan Bridge over the River Liffey. Dr. Stoney was a Master of Arts and Master of Engineering of the Dublin University, and in 1881 the honorary degree of Doctor of Laws was conferred on him in recognition of his eminent position in the world of engineering. He was the author of "The Theory of Stresses and Strains," a standard book in its day, and of various papers in the transactions of scientific and engineering societies. He was president of the Institution of Civil Engineers of Ireland in 1871, and for many years a most active member of that body. He was elected a Fellow of the Royal Society in 1881, and in 1874 was awarded the Telford medal and premium of the Institution of Civil Engineers; he was also the recipient of many other honours. In addition to being a great engineer, Dr. Stoney was a man of wide and varied reading, and his judgment in letters and in art was of the soundest. His sterling worth and the value of his services to the City of Dublin will be long remembered.

NOTES.

THE secretary of the Royal Society made the following announcement at the meeting of the society on May 6:—Sir David Bruce, who is in charge of the Sleeping Sickness Commission at present in Uganda, cabled to the society on April 3 that the commission had confirmed Kleine's observations on the period during which the tsetse-fly was capable of transmitting a trypanosome infection. A letter was received on April 30 from Sir David Bruce, dated Mpumu Chagwe, Uganda, April 3, confirming the telegram, and stating that the commission had "repeated Dr. Kleine's experiments with *Trypanosoma gambiense* and *Glossina palpalis*, also with a trypanosome of the dimorphon type and the same tsetse-flies, and found the flies infective after sixteen, nineteen, and twenty-two days."

IT is well known that Lord Walsingham has long been an unwearied collector and student of the smaller moths, and that his collection of the Micro-lepidoptera is the best in the world, as he has not only added to it largely by his own efforts, having collected assiduously during his travels in various parts of Europe and North Africa, California, Jamaica, &c., but has taken the opportunity to purchase the most celebrated foreign collections, among others those formed by Zeller, Frey, Christoph, and Hofmann, as they successively came into the market. He has also contributed numerous papers on the subject to the Transactions of the Entomological Society, the *Entomologist's Monthly Magazine*, &c., and has also published several independent works, especially on the Tortrices and Pterophoridæ of North America. In 1891 this valuable collection was formally made over to the British Museum by deed of gift, Lord Walsingham arranging to retain it in his own hands as long as he desired to do so; but we now understand that it is his intention to transfer the collection to the care of the trustees of the British Museum (an office which he himself shares with others) in the course of next year.

DR. R. P. VERNEAU has been appointed to the professorship of anthropology in the Paris Museum of Natural History in succession to the late Prof. Hamy.

THE fifth Congrès préhistorique de France will be held at Beauvais on July 26–31. The general secretary of the congress is Dr. Baudouin, 21 rue Linné, Paris.

THE *Times* announces the death of Dr. John Thomson, of Brisbane, at the age of sixty-one. Dr. Thomson was a graduate of the University of Edinburgh, and settled in Brisbane more than thirty-three years ago, where he became recognised as an authority upon matters relating to sanitary science. He served as president of the Royal Society of Queensland, and was president of the Intercolonial Medical Congress in 1899.

MR. E. DE KOVEN LEFFINGWELL, the American explorer, is about to start from Seattle for a three years' expedition to northern Alaska. His main object is to map out the coast-line for a few hundred miles on either side of Flaxman Island, his winter quarters. As opportunity offers, he will also study the geological formations of the territory, and try to find out some large rivers in the interior of which the natives speak vaguely. His yawl, the *Argo*, will carry an auxiliary engine, besides sails, and its cargo will be limited to thirteen tons.

THE successful congress in connection with the suppression of frauds in food, which was inaugurated last year at Geneva, will be succeeded by a similar congress to be held in Paris during October of the present year. The principal object will be to define such methods as will prevent the fraudulent adulteration of food, but there will also be sections devoted to chemical products, pharmaceutical preparations, mineral waters, and similar substances. Further information as to the congress can be obtained from Mr. Loudon M. Douglas, College of Agriculture, Edinburgh. The general secretary is Mr. Robert Fazy, 42 Rue du Rhone, Geneva.

ON Tuesday next, May 18, Prof. J. Garstang will deliver a lecture at the Royal Institution on (1) "Monuments of Egypt and Asia Minor," being the first of a course of two lectures on "The Hittites," and on Saturday, May 22, Dr. W. H. R. Rivers, F.R.S., will begin a course of two lectures on "The Secret Societies of the Banks' Islands." The Friday evening discourse on May 21 will be delivered by the Hon. Ivor C. Guest, on "Afforestation," and on May 28 by Dr. Emerson Reynolds, F.R.S., on "Advances in our Knowledge of Silicon as an Organic Element." An extra Friday evening discourse will be delivered on June 18 by Mr. A. Henry Savage Landor, on "A Recent Visit to the Panama Canal."

THE many friends of the late Mr. Bennett H. Brough will be glad to know that the proposal to establish some permanent memorial to him has taken definite shape. Shortly after Mr. Brough's lamented death, a fund for his widow and children was started by the council of the Iron and Steel Institute, of which he was secretary, and the sum of about 6000*l.* was raised. There are, however, many old students of the Royal School of Mines, as well as others who came under the influence of Mr. Brough's inspiring personality, who, now the institute's fund is practically closed, desire to show their appreciation of his life and work by a lasting memorial. A committee has therefore been formed to raise a fund for this purpose, and has issued an appeal for subscriptions. It is suggested that the memorial should take the form of a scholarship for boys from the City of London School, where he was educated, tenable at the Royal School of Mines, where, both as student and teacher, he did such excellent work. Contributions should be sent to Mr. R. E. Commans, Speer Road, Thames Ditton, Surrey.

CONSIDERABLE changes are announced in the staff and administration of the London Zoological Gardens. For several months past a special committee has been investigating the state of affairs at the gardens, and the innovations, which are expected to lead to decided improvements in the well-being of the animals, are the results of the deliberations of that body. Dr. Chalmers Mitchell, the secretary, will continue to act as chief administrative officer in the gardens (where he will reside when the society's library and offices are transferred there), for the efficiency of which he alone is responsible to the council. As subordinates, he is eventually to have under him three curators, one each for mammals, birds, and reptiles. Mr. R. I. Pocock, who is to retain his present post of garden-superintendent, will have charge of the mammals, and temporarily of the reptiles, while Mr. D. Seth-Smith is to take over the custody of the birds, combining with this duty the office of inspector of works. Each curator is to have a head-keeper under him, and the aim of the council is that both curator and head-keeper should devote their whole attention and time to the care of the animals under their charge. If this work is properly done, the curators will have no time to spend on scientific zoology, as the care of the animals is quite enough to occupy their whole energies.

ON May 7 Lord Avebury presided at the annual conversazione of the Selborne Society. He alluded to the Bill to stop the destruction of rare and beautiful birds for the sake of their feathers, which the society, acting on the suggestion of Mr. Buckland and in conjunction with the Linnean Society, Zoological Society, and the Society for the Protection of Birds, introduced into the House of Lords last year. The House of Lords was very sympathetic, and passed the Bill, but the House of Commons could not spare time to consider it. This year, said Lord Avebury, Sir William Anson has introduced a similar measure, and he heartily wished it success. Mr. James Buckland afterwards exhibited a number of slides bearing on the destruction of egrets. The subject of flight was considered by Mr. F. W. Headley, of Haileybury, who showed by means of slides how birds fly, while Mr. T. W. K. Clarke followed with a lecture on how men fly, in which he contrasted the methods by which birds fly with mechanical flight, and showed by means of gliders how machines are automatically balanced. He also made a strong point of the fact that in the science of aëronautics Englishmen in the past led the way, and cited the names of Sir George Cayley, Henson, Stringfellow, and Wenham. As usual, there was a large series of interesting exhibits. The following attracted considerable attention:—a working exhibition showing the processes of the manufacture of microscope lenses, Messrs. W. Watson and Sons; an attachment for converting a tourist's telescope into an instrument for insect observation, Messrs. H. F. Angus and Co.; and a plan showing the position of the nesting-boxes and nests during the coming month in the Brent Valley Bird Sanctuary, Mrs. Wilfred Mark Webb.

AN influential deputation waited upon Mr. Runciman, president of the Board of Education, on May 6, to place before him the objections to the alleged intention of the Government to distribute what is known as the Indian Collection at the South Kensington Museum. Lord Curzon, in introducing the deputation, gave a historical summary of the nature and position of the collection. Briefly, the facts are as follows. Last year a departmental committee was appointed to draw up a comprehensive scheme for the re-arrangement of the products in the South Kensington Museum, in the interests, first, of people engaged in commercial production, and, secondly, for the due encouragement of art. The committee reported in favour of classification by material of all the contents of the Victoria and Albert Museum. This recommendation has provoked much opposition; and the object of the deputation was to urge that Indian art demands independent treatment, and that the ethnographical features of the present collection would be altogether sacrificed if the distribution according to subjects were carried out. The hope was expressed, therefore, that the Government

would not agree to the dispersion of the collection, and would consider favourably some scheme by which it would be given a permanent and suitable house as a whole. In his reply, Mr. Runciman did not commit himself to either proposition, though he said, "I do not wish to leave the present collection in the present bad building, and I do not intend to scatter it in the sense which was at first proposed." The whole matter is to be given full consideration again before any action is taken. The situation provides another instance of difficulties arising owing to the want of scientific system in the organisation and administration of our national museums, upon which we commented on April 29. Thirty years ago, the original collection was broken up, the geological and mineralogical products being sent to Jermyn Street, the vegetable products to Kew, some of the antiquities to the British Museum, and others to South Kensington. Now it is urged that this distribution was a mistake, and that all the collections should be brought together under one roof. We express no opinion upon these plans of aggregation and segregation, but we do say that if our national museums were controlled by men of knowledge and authority a definite and continuous policy would be the result, and the demand for re-consideration which now arises when any change is proposed would rarely arise.

To the May number of the *Century Illustrated Magazine* Mr. E. B. Bronson communicates an article on big game in East Africa, with special reference to the conditions and incidents attending lion-hunting and the pursuit of other dangerous animals. The author, who was for a year the guest of Mr. McMillan at Julia Farm, near Nairobi, from which he made excursions to the game-country, has had thirty years' experience of big-game shooting in America, and his views in regard to African sport of this nature accordingly possess a more than ordinary value and interest. Mr. Bronson was much struck with the extraordinary abundance of game on both sides of the railway between Voi and Nairobi, where the passengers are seldom out of sight of some kind of game-animals during the daytime. Special reference is made to the dangers connected with the pursuit of buffalo and rhinoceros, the author appearing to endorse the general opinion as to the excessive risks attendant on buffalo-shooting.

IN the April number of *Das Blaubuch* Dr. T. Zell discusses the question whether animals take advantage of experience and become cleverer than their parents, the question being answered in the affirmative. Among numerous other instances mentioned by the author, reference may be made to the following. From early times it has been noticed that vultures have learnt to accompany armies in the field, for the sake of the prospective feast after a battle. Killer-whales accompany whaling-vessels, and gulls do the same. Crows in like manner learn to accompany the chamois-hunter as soon as they have seen the first victim fall to the rifle, and rough-legged buzzards follow the sportsman in pursuit of winged game. Birds and quadrupeds have learnt to take no notice of railway trains, as have horses of motors, and nowadays many fewer birds immolate themselves by flying against telegraph-wires than was formerly the case. Game animals of all kinds have learnt to know the range of modern rifles, while greyhounds have learnt to leave rabbits alone, just as foxhounds, if properly trained, take no notice of either hares or rabbits. Sheep-dogs, again, know by experience that it is only the members of their masters' flocks that it is their business to collect.

THE sixty-seventh volume of the Journal of the Royal Agricultural Society, for 1908, opens with a portrait and biography of the late Sir Nigel Kingscote, and contains a number of papers on agricultural subjects and fruit-growing. Among these is one by Mr. H. Rigden on Sussex cattle, which are stated to be nearly allied to the Devon, but larger, bigger-boned, and more hardy in constitution, both breeds being probably derived from old medium-horned red cattle of the south and south-western counties. In colour, Sussex cattle, which are still mainly confined to the home counties, should be wholly red, with white tail-tufts, but white flecks may appear on the body, and the muzzles of the bulls must be white. A century and a half ago it was noted that Sussex cattle, like the pigs of the same county, were unusually long-legged, and it was suggested that this feature was due to the bad state of the roads. Be this as it may, when the Weald district was the centre of a great iron-producing industry the strong-limbed Sussex steers were specially well adapted for hauling timber through the heavy undrained tracks of the partially cleared forest. The Lyne herd, dispersed in 1903, were descended from the old working breed, and were probably the oldest in Sussex.

DR. A. S. HITCHCOCK has prepared a catalogue, with analytical key, of the grasses of Cuba, that is published as the sixth part of vol. xii. of the Contributions from the United States National Herbarium. It is based largely on the specimens collected by Charles Wright, and named by Grisebach, Wright, and Sauvalle about 1870, and on recent collections made by members of the herbarium staff. There is a tendency to split the genera, as in the segregation of Syntherisma and Alloteropsis from Panicum. There is one genus of the tribe Bambuseæ, Arthrostylidium, with seven species. The new plants named by the author, which are enumerated in a separate list, include one new genus, Reimarochloa.

A FOREST pamphlet (No. 5) has been issued by the Government of India, in which Mr. A. L. McIntire deals with the production of "sal," *Shorea robusta*, in Bengal. Certain data are given for growth which indicate how greatly the figures vary according to the locality. In the Terai, saplings may grow 8 feet to 10 feet in as many years, but in dry districts the period would be thirty years or more. Natural reproduction from seed is difficult, as the seedlings are checked by faster growing species and creepers. A method of artificial reproduction consists in placing baskets of soil under seed-laden trees into which the seed falls and germinates; the baskets are then planted out where required.

IN the latest number of the Journal of the Royal Horticultural Society (vol. xxxiv., part iii.) there will be found the proceedings of the conference held last October on the spraying of fruit trees. The four papers read at the conference contain a considerable amount of negative expression of opinion, but there are many useful suggestions regarding the composition and value of different fungicides and insecticides, more especially in Prof. Theobald's paper and the appendices giving the proportions for various washes. Mr. G. Massee generally advocated winter spraying to combat fungus diseases, while Prof. Theobald pointed out that, as a remedy against insects, spraying must be applied at a time when the insect can be reached by the wash. The efficacy of tobacco washes was generally conceded, the one drawback to them being the expense.

AN important contribution to the cryptogamic flora of Leicestershire is made by Mr. A. R. Horwood in a paper

read before the Leicester Literary and Philosophical Society, and reprinted, with amplification, in the Transactions (vol. xiii., part i.). The author offers some general remarks on distribution, and provides a list of new records since the publication of the county flora in 1886 for all the crytogamic groups. Two well-marked regions are distinguished, the Charnwood Forest and the lowland region overlying Coal-measures, Keuper Marl, Lias Clay, or Sandstone. In these areas the chief plant associations are the calciphilous, the humus and peat dwellers, or oxylophytes, and the silicicolous. The lichens, liverworts, and mosses have been well worked, but there is opportunity for adding considerably to the records of fungi.

As a first step towards the preparation of a handbook on the trees of the Transvaal for the use of foresters, Mr. J. Burtt-Davy has compiled a preliminary catalogue of the native trees, that is published in the *Transvaal Agricultural Journal*. The species are catalogued according to their occurrence in four phytogeographical zones, the mist-belt, high-veld, middle-veld, and low-veld, and are also enumerated with vernacular names in systematic sequence. The mist-belt is the true forest region, and contains many species common to that part of the Transvaal and the eastern province of Cape Colony, such as the two species of Podocarpus, *Curtisia faginea*, *Olea laurifolia*, and others. The high-veld and middle-veld are steppe and savannah regions, but in the low-veld such important trees as the baobab, *Excoecaria africana*, *Afzelia quanzenis*, and *Copaifera mopane* are found.

WE have received the first part of the *Eugenics Review*, a new quarterly journal issued by the Eugenics Education Society (6 York Buildings, London, W.C.). In a short "foreword" by Mr. Francis Galton, it is explained that the review is not intended to rival the more technical publications of the Eugenics Laboratory, but rather to supplement them by demonstrating the bearing of eugenics on legislation and practical conduct; the review is consequently rather of a popular than a strictly scientific character, and the reader will hardly look for original contributions to knowledge in its pages. In the present issue Mr. Montague Crackanthorpe contributes an article on the eugenic field, the Rev. Dr. Inge an address on some moral aspects of eugenics, and Dr. Saleeby writes on the psychology of parenthood. Sir Edward Brabrook also deals briefly with the eugenic aspects of the Report of the Poor Law Commission. The address by Dr. Inge is of special interest as a thoughtful contribution to the subject with which it deals from a professor of divinity.

DR. J. J. DOBBIE, F.R.S., director of the Royal Scottish Museum, Edinburgh, in his report for 1908 gives a good account of the progress made in extending and re-arranging the important collections under his charge. In the archæological section the most valuable additions are the prehistoric Japanese collection of Dr. N. G. Munro, which is of the same type as that of Prof. Gowland, now in the British Museum, and a Babylonian clay tablet, which is believed to contain a missing portion of the Creation epic. Those of Dr. Felkin from the Upper Nile and of Dr. M. Pirie from the Burun country are interesting additions to the ethnographical series. The natural-history cabinets now contain the large collection of eggs of British birds made by Mr. O. A. J. Lee; a fine pair of Californian sea-elephants (*Macrorhinus angustirostris*), long supposed to be extinct, but lately re-discovered on the island of Guadalupe, some 200 miles off the coast of Lower California; and an example of the rare deep-sea oar-fish or ribbon-fish (*Regalecus glesne*), cast ashore at Dunbar. It is disquieting to learn that the safety of the collections is seriously endangered by the close proximity to the main building of two spirit stores, and it may be hoped that the Government will take early steps to acquire and demolish them.

UNDER the title of "The Romanichels, a Lucubration," Mr. Bob Skot issues privately through Messrs. R. McGee and Co., of Liverpool, a reprint of a lecture delivered before the Clevedon Naturalists' Association, in which he discusses the history, persecutions, character, and customs of the Gypsies. In this pamphlet he has brought together much curious information on this interesting people from sources not easily accessible, and he has reproduced, with the musical score, eleven characteristic Gypsy melodies, which were sung, probably for the first time before a learned society, during the delivery of this lecture. It is curious to find among the Gypsies survivals of the rule of concealed burial of the dead, streams, it is said, having been diverted, and the corpse buried in their beds, after which the water was allowed to resume its ordinary course. The writer attributes the custom, occasionally practised in this country at the present day, of burning the effects of deceased members of the tribe, not to the belief that these follow the dead man to the spirit world, but to the theory that the soul is so firmly attached to the body and its possessions that it cannot obtain freedom until these are destroyed. The custom of abstaining during life from the favourite food of a lost relation, and the belief that vessels are defiled by the touch of a dog's tongue or of a woman's skirt, suggest reminiscences of customs and taboos derived from the eastern home of the race.

PROF. G. MERCALLI has recently published a short account of the destructive Calabrian earthquake of October 23, 1907. The centre of the earthquake appears to have been near Ferruzzano, a small town on the east coast near Gerace. Here, 158 persons (or 8 per cent. of the inhabitants) were killed, and, immediately after the shock, the sea advanced inshore 30 metres, and then retreated. The district is one in which few earthquakes originate, but five preparatory shocks occurred in it, the first on the day after the earthquake of 1905, the last three minutes before the principal earthquake. Though the ground was fissured in places, there were no faults; there was no marked shifting of railway-lines, and no permanent displacement of the earth's crust. The number of after-shocks was small. Prof. Mercalli attributes the excessive damage at Ferruzzano to its erection on an isolated eminence and on a slope, and to the friable nature of the ground on which the houses were built.

THE Publications of the Iowa Geological Survey are usually devoted to economic subjects, but the eighteenth volume, just received, consists chiefly of a memoir of general scientific interest. This work, by Dr. Charles R. Eastman, of Harvard University, is entitled "Devonian Fishes of Iowa"; but it is, in fact, a discussion of the Lower Palæozoic fishes in general, with special reference to those found in North America. It is a critical summary of the subject, with many quotations from the latest memoirs, and a brief statement of Dr. Eastman's own opinions, which have already been published in scattered papers. The Devonian rocks of Iowa itself have yielded only fragmentary fish-remains, but one quarry in the upper beds has furnished an astonishing number of the teeth of Chimæroids and Dipnoans, which exhibit much variety. Dr. Eastman thinks that, when well-preserved skeletons are found, the Devonian Chimæroid fishes will prove to have been armoured with thin dermal plates and with

dorsal fin-spines. The most interesting discovery recorded is that of a new palæoniscid fish, *Rhadinichthys deani*, from the uppermost Devonian shales of Kentucky. It occurs in phosphatic nodules, and the state of preservation is such that even the brain and organ of hearing can be examined and described. According both to Dr. Eastman and to Dr. G. H. Parker, the brain, semi-circular canals with ampullæ, and even some of the blood-vessels, are actually phosphatised, and can be perfectly exposed by cutting away the investing bone. Dr. Parker adds a detailed description of these parts, showing that they differ in no respects from those of a typical modern bony fish, but the accompanying illustrations from photographs are unfortunately not satisfactory. Dr. Eastman concludes his memoir with a useful list of the Devonian fishes hitherto discovered in North America.

WE have received from the Meteorological Office charts referring to the meteorology of the North Atlantic and Indian Oceans, and from the Deutsche Seewarte similar charts for the North Atlantic, for the months of April and May, 1909, which are, as usual, replete with mean statistical and current information useful to seamen. In addition to data relating to normal conditions of winds, currents, &c., both institutions give special charts of fog and mist in the North Atlantic. During the warm season, from April to August, fog is a source of great danger to navigation, especially on the eastern part of the Newfoundland Bank, owing to marked differences of temperature between sea and air, and this danger is increased by the southern drift of icebergs across the sailing routes. From a useful report on the state of the ice in the Arctic seas in 1908, recently issued by the Danish Meteorological Institute, the opinion is expressed that there will be no abnormal risk from ice in 1909 either along the south-west of Greenland or near Newfoundland.

To the *Cairo Scientific Journal* for January last Mr. B. F. E. Keeling communicates an interesting paper on climate changes in Egypt. There is a strong belief amongst residents that changes have occurred within the last ten or twenty years (possibly due to increased irrigation) which are distinctly "sensible," without the aid of instruments. Mr. Keeling quotes the mean temperature at Abbassia for each pentade from 1870–1904, and for the four years 1905–8; but the results show that the differences are hardly greater than might be caused by difference of exposure of the thermometers. As regards humidity, also, there is very little evidence of any decided change during the last forty years. It is confidently asserted by many persons that the rainfall has increased during quite recent years, but the author shows that there is little, if any, evidence of such being the case. The total rainfall of any year is often influenced by the fall on a single day, and is consequently very variable from one year to another; the driest year on record at Abbassia is 1892, with little more than a quarter of an inch of rain, and the wettest, 1904, with less than 3 inches, the mean for 1887–1908 being approximately 1·4 inches.

IN No. 1, vol. i. (second series), of the Proceedings of the Tokyo Mathematico-physical Society, Mr. H. Nagaoka publishes the results of a recent research on the complex structure of some of the lines in the spectrum of mercury. The experiments were made with a 35-plate echelon spectroscope made by Hilger, and having a resolving power of 430,000 for light of wave-length 5000 Ångström units. The lines at λ 5790, λ 5769, and λ 5461 were analysed, and Mr. Nagaoka finds several companions in each case which were not recorded by Janicki, Galitzin, Stansfield, or Baeyer. A remarkable feature of the companions of the green line (λ 5461) is the symmetrical arrangement of certain pairs of them about the principal line, and an apparent constancy of wave-length difference between consecutive lines. Further research will be necessary to establish these features as objective realities, a point which is not overlooked by the author, who discusses at length the possibility of certain lines being illusory, optical phenomena.

THE origin of the colours of the spectrum forms the subject of an article, by Prof. P. Zeeman, in the *Rivista di Scienza*, v., 9. The first part is mainly philosophical in character, and deals with the question whether white light is really a mixture of rays of different wave-lengths or a mere succession of impulses, the phenomena of colour in the latter case being due to the action of the spectroscope. The second part contains a summary of recent results relating to magnetic action on light. Some recent experiments on the shifting of the middle line of a triplet are described by Prof. Zeeman in the Proceedings of the Amsterdam Academy, published January 27. In the *Archives Néerlandaises* (2), xiii., p. 260, Prof. Zeeman discusses the following questions:—applications of the decomposition of rays to the measurement of the intensity of magnetic fields; relation between the intensities of the components of a triplet; the dissymmetry in intense fields; observations by Fabry and Pérot's methods; determination of the charge on electrons; observations in the direction of lines of force; and dissymmetry of the triplets in the spectrum of tungsten. A note on Hale's observations of the magnetic decomposition of the lines of the spectra in sun-spots appeared in the *Physikalische Zeitschrift*, ix., 23, pp. 834, 835.

A SIMPLE method of finding indices of refraction of liquids under the microscope is described by Dr. Enrico Clerici in the *Atti dei Lincei*, xviii., 7. In its simplest form it consists of a glass slip with a thick cell, and a triangular glass prism cemented on it. A line ruled on the under side of the prism is brought into collimation with a wire in the focal plane of the eye-piece, and when the cell is filled with any liquid the apparent displacement of the line determines the index of refraction.

ON September 21, 1908, Dr. Hermann Minkowski read a paper before the German Naturalists' and Medical Association at Cologne on "Space and Time." It was his intention to develop the ideas into a more complete theory of mechanics, in which time would appear to be regarded as a fourth dimension coordinated with the three dimensions of space. Unfortunately, Minkowski did not live to realise his project, his life coming to a premature end on January 12. In accordance with a wish expressed by him, "Space and Time" has now been printed by the Teubner Press, of Leipzig, with a preface by Prof. Gutzmer, of Halle, and a portrait of Minkowski. It is an interesting memorial of the author, and the printing and general get-up are of the best.

DESIGNERS of posts and brackets for electric street lighting will be interested in two well illustrated articles on these fittings in the April number of the *Illuminating Engineer* of New York. Although many of the posts figured are most elegant in design, there is obviously a tendency in America to introduce Corinthian columns more appropriate for supporting substantial buildings than are or incandescent lamps.

La Nature for April 24 contains an account of the experiments and measurements which have been made to discover what was the cause of the notoriously bad acoustical properties of the large hall of the Trocadéro at Paris. The work has led to several valuable conclusions as to the effect of a sound reaching the ear by two paths which differ in length by various amounts up to 34 metres. One of these is embodied in the statement that, for good audition, surfaces far from the audience must be absorbent, while surfaces near them must be reflecting.

IT will be remembered that two years ago the well-known "pleochroic haloes" observed in rock sections were shown to be due to the radio-activity of the inclusion round which the halo occurs. The point was brought out about the same time by Prof. O. Mügge in Germany and by Prof. Joly in this country. The former author now contributes further observations on the action of radium in producing these effects on a variety of minerals. His results will be found in the *Centralblatt für Mineralogie* (1909, p. 65).

MR. C. BAKER, of 244 High Holborn, W.C., has submitted to us two microscope objectives of a new formula which he has recently placed on the market. They are (1) a one-sixth inch numerical aperture, 0·75; (2) a one-twelfth inch numerical aperture, 1·30. The former has approximately a working distance of one millimetre, which for its focal length is considerable, and is intended for use with thicker cover glasses or with a hæmocytometer. The one-twelfth inch objective is particularly suited for bacteriological work, and, considering that it has a large field, its definition is excellent. We have tried these lenses both visually and photographically, and can find little fault with them. They are of the type that most English makers have recently introduced, and are intended to meet the need for cheap lenses for students' purposes and for ordinary use in the commercial applications of the microscope. The prices of these lenses are thirty shillings and five pounds respectively, and it is somewhat reassuring to find that English firms are making a determined effort to meet the severe Continental competition in the cheaper class of microscope apparatus, by introducing lenses of such a high order for so reasonable a price. Photographically, both these lenses are most satisfactory, and, if used in conjunction with a light yellow screen which cuts out the blue-violet portion of the spectrum, the results to be obtained with them are excellent. In common with most lenses of this type, their focal length is slightly shorter than marked, but this but little detracts from their performance.

THE new White Star liner *Laurentic* left on her first voyage to Canada on April 29. The performance of this vessel, built by Messrs. Harland and Wolff, of Belfast, will be looked for with interest, as she is the first Atlantic liner to be fitted with a combination of reciprocating and turbine machinery. Meanwhile, we note from an article in *Engineering* of April 30 that the vessel has a length of 565 feet 6 inches over all, beam 67 feet 3 inches, and depth, moulded, 45 feet 6 inches; the displacement at service draught is about 20,000 tons. The idea of the combination of machinery is to utilise in the turbine the remaining heat energy in the exhaust steam from reciprocating engines, which is generally at a pressure not less than 10 lb. per square inch absolute. The Parsons steam turbine enables such steam to be expanded economically to a very low absolute pressure. In the *Laurentic* the reciprocating engines are of the triple-expansion type, with four cylinders to ensure perfect balancing. There are twin reciprocating sets, the low-pressure Parsons turbine being placed in the centre of the ship and abaft the main engines, giving three propeller shafts. Arrangements are provided for throwing the turbine out of action for all manœuvring, the reciprocating engines then passing their exhaust steam direct to the condenser. The experience derived from this vessel should be of service in proportioning the machinery of the two 45,000-ton White Star liners now being built in Belfast.

OUR ASTRONOMICAL COLUMN.

MERCURY AS AN EVENING STAR.—In the comparatively clear evening skies of the past week, the planet Mercury has not been difficult to locate when one knew the direction in which to look for it. At present it is in the constellation Taurus, to the south-west of β Tauri, and sets about two hours after sunset.

The greatest eastern elongation takes place on May 20, but the planet is better seen some days before, rather than after, an elongation occurring in the spring. At 8.30 p.m. on Saturday last, May 8, it was easily found with opera-glasses whilst some four or five degrees from the horizon, and then watched for some time with the naked eye.

THE PRESENT SOLAR ACTIVITY.—A large group of spots was seen coming round the eastern limb of the sun on Friday last, May 7, and was in full view on Saturday, when it was seen to consist of two moderately large spots with several smaller ones, and to cover a fairly extensive area. On Sunday the group was visible to the naked eye, shielded by a piece of smoked glass, whilst with a pair of opera-glasses (×3), similarly shielded, it was quite a prominent object.

Spectroscopic observations made at the Solar Physics Observatory by Mr. W. E. Rolston on Saturday showed that the dark D_3 (helium) line was to be seen quite marked in the different inter-umbral areas and beyond the group.

THE INTRA-MERCURIAL PLANET PROBLEM.—As reported in our discussion of the results obtained by the Lick-Crocker eclipse expedition to Flint Island (NATURE, No. 2038, vol. lxxix., p. 70, November 19, 1908), Prof. Campbell considers that the negative results obtained at successive eclipses in the search for a possible intra-Mercurial planet demonstrate that no such planet exists as would account for the anomalies in the motion of Mercury.

In the May number of the *Popular Science Monthly* (vol. lxxiv., No. 5, p. 494) he now gives a most interesting popular account of the search for the hypothetical planet, and the means whereby its existence has been disproved.

In closing this account, Prof. Campbell refers favourably to Prof. Seeliger's recently published conclusions that the Mercury anomalies may be accounted for by the action of the material which gives rise to the zodiacal light, and shows that the figures calculated by Seeliger agree, within the probable errors, with the observed values, as reduced by Newcomb, of the perturbations of Mercury, Venus, the earth, and Mars.

The Lick Observatory search is fully discussed, in Bulletin No. 152, by Dr. Perrine, who points out that, whilst small bodies may yet be discovered near the sun, the eclipse plates show that no planet of the eighth magnitude was photographed. Such a planet would hardly exceed twenty or thirty miles in diameter, and it would require about a million such bodies to account for the outstanding Mercury perturbations.

PARTIAL ECLIPSE OF THE SUN IN CANADA.—From Dr. Downing we have received particulars of the partial phase of the solar eclipse of June 17 as visible at the Canadian observatories. At Ottawa the greatest phase (0·601) will occur at 7h. 43m. (standard time, 5h. W.), and the sun will set partially eclipsed at 7h. 50m.; first contact will occur at 6h. 52m. At Toronto the times will be:—first contact, 6h. 57m.; greatest phase (0·540), 7h. 48m.; sunset, 8h. 0m. In each case the sun's altitude at first contact will be approximately 9°